DOCUMENT RESUME

ED 150 885 PS 010 079

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TITLE Learnings from Compensatory, Preschool Education.
SPONS AGENCY Waters Foundation, Framingham, Mass.
PUB DATE Aug 77
NOTE 20p.; Paper is a synopsis of lectures presented at the International Seminar on Developmental Psychology (Trier, West Germany, August, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Behavioral Science Research; *Compensatory Education; Early Experience; *Educational Accountability; Educational Technology; Nature Nurture Controversy; Parent Education; *Preschool Education; Prevention; *Program Effectiveness; *Socioeconomic Influences
IDENTIFIERS *Project Head Start

ABSTRACT

This paper presents a discussion of the value of compensatory education for preschool children from poor and uneducated families, focusing on knowledge gained from 12 years of experience with compensatory programs in the United States. The development of Project Head Start is described, and the role of behavioral science research in the development of social policy and social reform is discussed. Several issues concerning the effects of heredity and environment on child development are examined, including the negative evaluations of Head Start, Jensen's claims for the heritability of intelligence, critical periods in development, the plasticity of development, and the role of early experience in psychological development. Also discussed are several approaches to improving compensatory pedagogy. The final section of the paper emphasizes the potential of preventive rather than treatment programs for improving the educational achievement of children from poor families. This section describes various parent and infant programs which are proving to be valuable alternatives or additions to programs for the preschool child. (BD)

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LEARNINGS FROM COMPENSATORY, PRESCHOOL EDUCATION[1]

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1. For support of the preparation of this paper, I wish to thank the Waters Foundation of Framingham, Mass. This paper is a synopsis of lectures for the International Seminar on Developmental Psychology, supported by the Volkswagon Foundation, Trier, West Germany, August, 1977. Once translated into German, it is scheduled to appear in a volume tentatively to be entitled "Fortschritte der Entwicklungspsychologie" ("Progress in Developmental Psychology") under the editorship of Professor Leo Montada.

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LEARNINGS FROM COMPENSATORY, PRESCHOOL EDUCATION[1]

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The United States have completed a dozen years of experience with efforts to overcome with compensatory education, the achievement consequences of early rearing by poor parents with little education. This paper summarizes the lessons that we (or at least I) have learned from this experience. These lessons fall into several domains: (1) the role of behavior science in social policy and social reform, (2) the hoary issue of heredity and environment, (3) psychological development and the technology of compensatory pedagogy, and (4) the issue of treatment versus prevention.

BEHAVIOR SCIENCE, SOCIAL POLICY AND SOCIAL REFORM

The American experience began with Project Head Start. Its launching illustrates a role behavioral science can play in social policy and social reform. Daniel P. Moynihan, a social scientist in the political arena, has contended that "if radical (social) change takes place, it comes through knowledge, not slogans, not simply enthusiasm, but through the impact of knowledge" (Moynihan, 1963).

Project Head Start was part of the War on Poverty launched during the presidencies of John F. Kennedy and Lyndon B. Johnson. The dissonance of poverty amid the affluence of the world's wealthiest nation became compelling in the years following World War II. It was augmented and focused by such writings as Michael Harrington's (1962) The Other America, and by Kennedy's encounters with rural poverty during his primary election contest of 1959 with Hubert Humphrey in Virginia. Such were some of the influences instrumental in Kennedy's making a War on Poverty central in the program of his presidency and in making the idea for such a war one whose time had come.

Including early education in this war illustrates Moynihan's contention concerning the importance of knowledge. It has always been obvious that failure in school is especially prevalent among the children of poor and uneducated parents. So long as a belief in genetically predetermined development prevailed as part of the social Darwinism of Herbert Spencer, the traditional American value of equality of opportunity was irrelevant to the lack of opportunity of children in poor families during the preschool years. In the early 1960s, however, two books appeared that organized the evidence of plasticity in early psychological development (Bloom, 1964; Hunt, 1969). These works were written for the scientific community, but through fortuitous circumstances, they influenced the political thinking (see Steiner, 1976). One of John F. Kennedy's siblings was mentally deficient. Moreover, his sister Eunice (Mrs. Sargent Shriver) had therefore taken special interest in mental retardation. The Shrivers had chosen for their children an outstanding pediatrician who had fathered a deficient child. According to Steiner, it was he who drew the books of Bloom and Hunt to the attention of the Shrivers, and they to the

attention of President Kennedy. The evidence of plasticity and of the importance of experience in the development of competencies made the value of equality of opportunity highly relevant to the inequality of educational opportunities within families of diverse education and income. It also justified a hope of breaking the poverty cycle. The result was Project Head Start.

Project Head Start

The War on Poverty got its legal authorization from the Congress in the Economic Opportunity Act of early 1964. Project Head Start was proposed by an interdisciplinary task force chaired by Dr. Robert E. Cooke, on the assumption that "there already exists adequate understanding of the problems and processes involved to permit an immediate and massive intervention in the poverty cycle" (see Steiner, 1976, p. 27). Although this task force was as much concerned with hopes for gains in health and nutrition as in school success, the publicity from the White House emphasized hopes of school success for poor children.

Project Head Start was launched in the summer of 1965 with plans for about 100,000 children. The demand led to enrollment of half a million in slightly more than 11,000 centers. Programs for full-year Head Start were begun in the fall of 1965. In October of 1966, the White House asked me to chair another task force on early child development. Our report, entitled A Bill of Rights for Children (Hunt, Chairmn., 1967), resulted in an extension of Head Start down the age scale in a program of Parent and Child Centers, and up the age scale in a program called Follow-Through. This task force also recommended a federal office for children with a director reporting immediately to the secretary of the Department of Health, Education, and Welfare which President Nixon later followed in establishing the Office of Child Development, now the Administration for Children, Youth and Families.

Excited as were those most knowledgeable by the prospect of public support for early education, we recognized that it is one thing to have evidence that a goal is attainable, but something quite different to have the technology for achieving that goal. We feared that overselling such a broad-scale program might well lead to an overkill of support for the work needed to develop an appropriate technology in case the unrealistic hopes were not realized.

As I have reflected on the history of Project Head Start in the light of Moynihan's proposition, it seems to me essential to reduce the factor of chance in making knowledge available to the political process. As human society faces the task of coping with the problems created by human inventiveness, we must devise and institutionalize a far better means for knowledge from the behavioral, educational, and social sciences to figure in the decisions of social policy that guide social change. Moreover, people of government and politics as well as of the behavior and social sciences must realize that it is one thing to recognize that a reform is possible, but something very different to know how to achieve it. Realizing this implies the necessity for programs to develop appropriate technologies for desired

reforms. Although this lesson extends far beyond the limits of developmental psychology and preschool education, it is one strongly impressed upon me by American experience with early education.

HEREDITY, ENVIRONMENT, AND DEVELOPMENT

Despite the popularity of Project Head Start among both the people and their Congressional representatives, the project had to face negative evidence from evaluative studies mandated in the authorizing legislation. These evaluations and the responses they evoked are a major source of lessons.

The Evaluations

The findings of the first large-scale surveys by the United States Commission on Civil Rights (1967) and by the Westinghouse Corporation (Cicarelli, 1969), brought evidence of failure to fulfill the unrealistic hopes for school success. Although the planners had included family, medical, and nutritional goals as well as that of avoiding school failure, the latter was the exclusive focus of these early evaluations. The short, summer programs appeared to result in no appreciable gains in cognitive or affective development. The longer, full-year programs resulted in improvements in reading readiness greater than those occurring spontaneously in non-participants from families with similar educational and economic backgrounds, yet the children participating in Head Start continued to score below national norms on standardized tests of academic achievement and language development. Moreover, the advances in such academic skills as reading readiness in the participating children had largely washed out by the end of the kindergarten year or at least by the end of first grade. A variety of smaller evaluative studies (see Grotberg, 1969) were conducted with similar findings, and very few concerned the domains of health and nutrition. Somewhat later, the Kirschner report (Lazar, et al., 1970) on the Parent and Child Centers helped to reassure people in government by findings of (1) increased involvement of thepoor in decision making, (2) increased employment of people from the poverty sector as paraprofessionals, (3) increased emphasis on the educational needs of children from poor families and (4) improvement in the health services to both children and families of poverty. Despite such findings, it was the failure of Head Start to overcome in a summer or a year of nursery schooling the effects of four years of educational deprivation that brought reactions demanding comment.

Revisiting the Belief in Hereditary, Predetermined Development

Several factors helped to account for this so-called failure (see Hunt, 1969, Chap. 5). These include the unrealism of the educational goal, inadequate understanding of social-class differences in the experiences relevant to educational competence (see Hunt, 1969, Chap. 7; 1975a, pp. 283-285). The inadequacy of the nursery-schooling available for deployment to achieve the compensatory educational goal or lack of a technology for compensatory education due to limitations of our understanding of psychological development and how to foster

it (see Hunt, 1969, Chap. 7; 1975a, pp. 285-292), and the possibility that launching this effort at compensatory education in the fifth year of children's lives may itself have limited its educational effectiveness (Hunt, 1975a, p. 282, also see below). Despite the capacity of such factors to explain the so-called failure, one reaction has been revisiting the old belief in development predetermined by heredity.

Arthur Jensen (1969) opened his now well-known paper with this sentence: "Compensatory education has been tried and it apparently has failed." After a discourse on heritability of the IQ and of scholastic achievement, he went on to consider social-class and race differences in such tests of competence as, therefore, biologically inevitable, a view traditional from the days of Herbert Spencer and Sir Francis Galton through World War II (see also Jensen, 1972, 1973; Herrnstein, 1973). Since Jensen's paper and interpretation of the failure of compensatory education got wide-spread circulation and attention in quarters of both educational and political influence, it is important to examine the relevance of heritability to educability.

Relevance to Educability: Heritability Versus the Range of Reaction

Heritability is defined as that portion of the total variance in the measures of a phenotypic characteristic, within a specific population, that is determined by genetic variation within that population (Rieger, et al., 1968, p. 213; see also Hunt, 1973). The heritability of the IQ, one measure of phenotypic competence, is assessed by means of comparisons of the correlations between the IQs of pairs of individuals with differing degrees of genetic relationship. Since the environments also vary, statistical manipulations of the differing correlations for pairs differing in degrees of relationship, e.g., fraternal vs. identical twins (Jensen, 1967, 1969), produce estimates of heritability. At best, such measures of heritability yield but indirect assessments of influence from the life history. This indirect relationship, in turn, is based upon the assumption that the percentages of variance from the sources are additive. Thus, to estimate the percentage of variance attributable to all aspects of the life history, one subtracts from the total variance (i.e., 100%) the measured percentage of variance attributable to heredity. Jensen has revived the traditional claim that 80% of variance in the IQ is heritable. This leaves but 20% attributable to all influences of the life history: diet, early experience in the family, education, etc. By both definition and operation, however, any given estimate of heritability is limited to that sample of genotypes and that sample of environments on which it was based. Merely assembling a number of them, all from limited samplings of the human population, does not change this. Therefore, inasmuch as educability includes all of the achievements to be obtained potentially from all of the improvements in child-rearing that may ever be imagined and developed, these measures of heritability based on existing states of affairs become logically irrelevant to educability. In other words, indices of heritability are at best, an indirect means of estimating educability that are, ultimately, logically irrelevant to educability.

On the other hand, a model for assessing educability directly is suggested by the concept of the "range of reaction" which Richard Woltereck suggested in 1909 (see Dunn, 1965). The norm, or range of reaction, is defined as the variation of a measurable phenotypic characteristic which a given genotype can produce in response to variations in environmental circumstances (Rieger, et al., 1968). A direct measure of any phenotypic educational achievement, including the IQ, can be obtained by holding constant the genotype and varying the environmental circumstances which provide infants and young children with intimate transactions with things and people that vary in both frequency and kind, then measuring the differences between the mean levels of achievement. While no general estimate of the range of reaction is any more possible than is a general estimate of heritability, educability must be at least as great as the maximal difference between any obtained mean levels of educational achievement obtained from samples of individuals from the same population who have been reared under differing circumstances. Moreover, when such an obtained difference is reproducible, it is both more direct and more relevant to educability in an infinite degree than is any percentage of variance in the IQ obtained by subtracting from 100% an estimated heritability percentage.

The data so far available from this strategy of investigation are painfully few, but those existing clearly lend further credence to the evidences of plasticity which helped to launch Project Head Start. My colleagues and I have employed this strategy in longitudinal studies of the effects of interventions in the child-rearing practices of the orphanage of the Queen Farah Pahlavi Charity Society on samples of foundlings taken from the Municipal Orphanage of Tehran when no more than a month old (Hunt, Mohandessi, Ghodssi & Akiyama, 1976). In this program, for both ethical and investigative reasons, we employed "wave design" instead of simultaneous control and treatment groups. The control group consisted of 15 foundlings for which the only intervention consisted of repeated examinations with the ordinal scales of Uzgiris and Hunt (1975) every other week during their first year and every fourth week thereafter. The intervention with each successive sample or wave, starting each roughly a year later than its predecessor, was designed to foster better sensorimotor development. The dependent variables were the mean ages of achieving the steps on the seven Uzgiris-Hunt scales. The outcome findings show that the mean ages at which the infants in each successive wave achieved the steps on these scales, except for the second that got an abortive attempt at audio-visual enrichment, were substantially younger than the mean ages for its predecessor. The mean ages at which the 25 foundlings in the first two waves, the controls and those getting abortive audio-visual enrichment, achieved the top steps on these scales averaged older by from 34 to 87 weeks than the mean ages at which those top steps were achieved by the infants in the fifth wave where the infant-caretaker ratio was reduced from 10/1 to 2/3 or 3/1 and the caretakers were taught the Earladeen Badger (1971b, 1971c) learning programs for infants and toddlers supplemented with instructions for procedures calculated to foster the development of vocal imitation and semantic mastery of things associated with the caretaking operations. The mean of these differences in mean ages for all scales was 60.4. Since we lack frames of reference with which to interpret such differences in mean ages of achievement, it may be useful to transform them into points of the IQ-ratio for each of the

seven branches of development. This transformation (see Hunt, Paraskevopoulos, Schickedanz & Uzgiris, 1975) results in differences in mean points of IQ-ratio extending from a low of 34 points to a high of 80 points, and the mean of these differences in mean IQ-ratios is 46.7.

The children were still very young when this testing was done. The evidence available suggests that size of such differences increase with time. For instance, the maximal cross-cultural difference between mean Draw-A-Man IQs is 73 points, where the testing was done when the children were between 6 and 9 years of age (Dennis, 1966). Moreover, if one combines findings from studies of the retardation associated with orphanage rearing (Dennis, 1973; Skeels, 1966; Skeels & Dye, 1939), which show a mean loss of the order of 50 points, with studies of advancement from educational day-care at age 66 months (Heber, et al., 1972) which show a mean gain of at least 25 points, the maximal obtained difference is of the order of at least 75 IQ points. Clearly, in neither of these latter cases do the contrasting means come from individuals derived from the same population. On the other hand, the samples of foundlings without pathology reared under the several interventions at the orphanage in Tehran do constitute infants from the same population. Moreover, Sandra Scarr (see Scarr & Weinberg, 1976) has found that Black children adopted early by educated white parents have a mean IQ of the order of 25 points higher than do Black children reared by uneducated Blacks in the poverty sector. Such findings, few as they are, argue strongly against revisiting the belief in genetically predetermined development to explain the so-called failure of Project Head Start.

The Issue of Critical Periods

My statement that focusing the experiences of Head Start on the fifth year in the life of children may have limited its compensatory effectiveness deserves comment. I have contended that every period in a young child's life is critical for the kinds of experience that will elicit adaptive modifications in the information and abilities the child has already achieved (Hunt, 1961, pp. 267-288). Yet, this may not be the whole story. H. T. Epstein (1974a, 1974b) has found evidence of biennial spurts both in the growth of head size, which are relatively independent of other somatic growth, and in the IQ. These spurts in head size and in IQ come at the same ages, namely at periods from 2-4, 6-8, 10-12, and 14-16 years.

The concept of critical periods proposed by such ethologists as Heinroth, Lorenz, and Thorpe was based upon observations of imprinting in birds and later generalized to sheep and dogs by J. P. Scott (1945). According to this conception, various behavioral characteristics may fail to appear unless young animals are provided with opportunities for appropriate kinds of experience at the time the anatomical structures underlying them are maturing. Epstein's is a conception of critical periods very different from this one of the ethologists. He conceives the spurt in head size as reflecting high rates of growth in the brain which enable experience to be especially effective in modifying the sensorimotor organizations that underlie knowledge and abilities. If Epstein is correct, then Head Start attempted to help children catch up to those from the middle class

the first lull in what he calls "phrenoblysis," i.e., during the first period when the rate of brain growth and of the capacity for rapid development in competence is slowed.

It is of interest to examine the findings from Project Head Start, its extensions, and research on compensatory education in the light of Epstein's hypothesis of phrenoblysis. Compensatory education during the fourth year has yielded evidence of gains considerably larger than those typical of the fifth year (see Hunt, 1975a, pp. 291-323). Such a finding is consonant with Epstein's hypotnesis, but it may also result from the fact that a year of preschooling constitutes a larger portion of the lives of those aged four than of those aged five at the end. The Follow-Through Program has also yielded preliminary evidence that continuing compensatory education through the period when children are aged six to eight leads to gains much larger than those typical of one-year programs through the fifth year (Hunt, 1975a, p. 316). Certainly this finding is not dissonant with Epstein's hypothesis of phrenoblysis, but the increased gains may also be attributed to the fact that compensatory education in Follow-Through Programs takes place over four or five years out of an eight or nine-year-old's life, whereas traditional Head Start takes place within but one year of a five-year-old's life.

Instability of Gains from Compensatory Education

The failure of the gains from compensatory education during the fourth and fifth years to persist once children enter the public schools deserves interpretative comment. According to our traditional conception of behavioral development, the basic structures and/or units of behavior come about more or less automatically as a consequence of anatomical, including especially neuroanatomical, maturation. Maturation has been presumed to be controlled by heredity. The environmental circumstances encountered are considered to be important neither for the rate nor for the structures of behavioral development (see Hunt, 1961, Chap. 4).

Yet the evidences of plasticity in the development of behavioral characteristics continues to grow (see Hunt, et al., 1976). For some, this evidence of plasticity appeared to mean that the rate of behavioral development could be modified by stimulation. For those educationally indoctrinated with the mental age of Binet and Simon (1905) and the IQ of Wilhelm Stern (1912), the first question asked from evidence of gains from compensatory education has been: "Are these gains permanent?"

An alternative view of behavioral development leads to no such expectation. Development is conceived to come about through the adaptive modifications called forth in thecourse of an infant's transactions with its material and social environment. Thus, behavioral development is not a matter of environment, per se, but rather the consequence of the use of sensorimotor organizations and of adaptive modifications in those elicited or permitted in an infant's or child's encounters with its circumstances.

Such a view is highly consonant with evidence both new and old. It is consonant with the evidences of apathy and retardation almost universally found associated with being reared from birth in understaffed orphanages, retardation that is reflected in mean IQ deficits of the order of 50 points (see above). It is consonant with the finding that children in groups typically found to be retarded achieve unusually rapid development if the growth-fostering quality of their material and social circumstances are improved in various ways. This proposition holds not only with infants in orphanages (Hunt, et al., 1976; Saveth & Dennis, 1965; Skeels & Dye, 1939), for the responsiveness and variety of inanimate materials and social relationships of home environments (Yarrow, Rubenstein & Pedersen, 1975) and for the IQs and academic achievements of Black infants adopted into the homes of educated white parents (Scarr & Weinberg, 1976), and infants of uneducated parents of poverty who are given the advantage of educational day-care (Heber & Garber, 1972; Hunt, Paraskevopoulos, Schickedanz & Uzgiris, 1975). It seems to be clear that the longer the improvements in the growth-fostering quality of rearing circumstances endure, the larger and more stable are their effects (see especially Bloom, 1964, and Skeels, 1966).

Plasticity cuts both ways. Whether development is hastened or retarded in general, or hastened or retarded along separate branches, is very much a matter of whether and what kinds of adaptive modifications are called forth by the environmental circumstances a child encounters. Thus, children typically gain in programs of compensatory education if the experiences provided in those programs are at all relevant to the measures of behavior employed in evaluations. Since plasticity cuts both ways, however, once children are no longer called upon for the adaptive modifications demanded by the program of compensatory education, their development becomes a function of those adaptive modifications elicited by their experiences at home and in their neighborhoods. As Jencks (1972) and others have shown, the variations in the development-fostering quality of homes are far more potent than the variations in schools in fostering differences in measures of intelligence and academic achievement. Thus, once the compensatory education ceases, the children of uneducated parents of poverty soon begin to fall behind those of better educated more affluent parents in their rate of achievement.

This alternative conception of the role of experience in psychological development is nicely illustrated in the findings from the Milwaukee project. The children in the treated and control groups have now been retested over a period of approximately five years in school. Heber (1977) has reported that the average IQ of the treated group has dropped from 124 to about 105. Thus, the rate of their achievement of the information and skills sampled in tests of intelligence has relapsed relative to those on whom the norms were based. On the other hand, the mean IQ of the treated group remains between 25 and 30 points above that of the untreated "controls." Unless the uneducated parents of poverty are shown how to foster the psychological development of their young, or unless the compensatory educational experiences are continued until the educationally deprived children have mastered most of the essential information and skills, or have acquired a self-motivating sense of the importance of school achievements,

a relapse is inevitable. If this alternative view of the role of experience in psychological development did not already exist, the findings of Project Head Start and compensatory education would suggest it.

PSYCHOLOGICAL DEVELOPMENT AND TECHNOLOGY FOR COMPENSATORY PEDAGOGY

Along with Project Head Start came a surge of research and development in the technology of compensatory pedagogy (see Hunt, 1975a, pp. 283-303). This surge was motivated in large part by recognition that Head Start had been launched without an appropriate and tested educational technology.

One category of studies concerned the ways in which the opportunities of the children of uneducated parents of poverty differed from those of the better educated, well-to-do parents (see Hunt, 1969, Chap. 7). Nutritional deficiencies and emotional distress were more common among both children and mothers of poverty than of those better educated of the middle-class. Children of the uneducated poor were especially deficient in opportunities to acquire information, cognitive skills, and especially semantic mastery of such elementary abstractions as colors, positions, shapes and numbers (Kirk, Hunt, et al., 1975). Moreover, poverty made the future uncertain and deprived these of an opportunity to learn how to postpone momentary gratification in the hope of more enduring future forms. Thus, they lacked opportunities to learn how to control their impulses, and the opportunities to obtain reinforcement from taking initiative. Moreover, many of the social models from which children of uneducated parents of poverty acquire their standards of conduct and value are themselves antisocial (see Hunt, 1969, Chap. 6 & 7). In the light of the plasticity in early psychological development, such evidences of class differences in rearing experiences help greatly to explain the school failure and also delinquencies of children from the poverty sector. Whether these are indeed deficiencies has been questioned (see Baratz & Baratz, 1970), but the evidence of deficiencies in semantic mastery of elementary abstractions is clear.

Such findings have led a number of those concerned with improving the technology of compensatory pedagogy to focus directly upon the school weaknesses of the children of uneducated parents of poverty. Some of these (e.g., Donald Bushell at the University of Kansas and Lauren B. Resnick at the University of Pittsburgh) were inspired by the application of B. F. Skinner's (1954) principles of operant learning to the art of teaching. At the University of Illinois, Bereiter and Englemann developed what they sometimes termed their "pressure cooker," with a same focus on school skills. Such teaching resulted in the largest advances on psychometric tests of achievement and intelligence while the children were engaged in the compensatory schooling. They were also found, however, to show the largest losses of advancement during kindergarten and first grade. The large size of the losses probably resulted from the absence of external rewards in the standard school situations, but perhaps also from the fact that such teaching failed to inculcate the internalization of motives to excell in school tasks (for references, see Hunt, 1975a, pp. 286-292).

Another approach stemming from knowledge of the deficiencies of other children from poorly educated families of the poverty sector consisted of increasing the academic content individually chosen and group-planned activities. This has been the approach of Marie Hughes at the University of Arizona, of the work of the Educational Development Center of Newton, Mass. modeled on the open infant schools of England, and of the Bank Street School in New York. The work of Nimnicht, Meier and McAfee of Greeley, Colorado, followed this approach, but also made of their school a responsive environment. The work of Cynthia and Martin Deutsch, among the earliest pioneers of compensatory education, and Lasser Gotkin at the Institute for Developmental Studies in the Graduate School of New York University stressed games of communication. While these programs improved performance on tests of academic achievement and intelligence to a somewhat lesser degree than did those more formal approaches, they resulted in somewhat lesser losses during kindergarten and first grade, and they also achieved other kinds of gain. For instance, the Mexican children of poverty in the classes of Marie Hughes produced more different sortings on a sorting task than did even Anglo children at the end of the first grade in a traditional class. The children in programs employing free choice of tasks showed improvements in tests of initiative. Those of the Deutsches and Lasser Gotkin showed improvements in communication between children. Such findings appear to illustrate the principle that there is a substantial degree of specificity between the kinds of experiences children have and the kinds of developmental advances they show (Hunt, 1975a, pp. 285-292).

Preliminary findings in the Follow-Through Program tend to confirm these from efforts to improve the technology of compensatory education, with some interesting additions (see Hunt, 197a, pp. 311-316). Follow-Through employed a scheme of planned variation which might better have been the model for Head Start. The preliminary evaluation of 1974 compared the averages of mean measures of academic achievement by children in 137 Follow-Through classes with those in 117 comparison classes. Those Follow-Through classes most superior to comparison classes on standard tests of academic achievement had used Skinner-type methods of teaching with focus on scholastic achievement. Where the performance of comparison classes has tended to fall each year to 1.2 years below the norm by the end of the fifth grade, Follow-Through classes more than hold their gains, and by the end of the fifth grade were .2 and .3 years above the norm. Moreover, there is again evidence of the specificity of relationship between kind of experience and kind of advance. Evidence of other interesting outcomes has come from a study by Milton Greenberg in Philadelphia (see Hunt, 1975a, p. 315). Teacher turnover was lower in Follow-Through programs than in regular programs. Of the parents of children in Follow-Through programs, 96% reported that the program had increased their interest in their children's education. That this is more than lip-service comes in evidence of reduced family mobility. Where the Office of Education had found 40% of pupils in comparable neighborhoods moving each year, 72% of those in the Follow-Through Programs remained continually in the same classes through a period of four years. Of those with Head Start experience also, this percentage is 76% through a period of five years. Despite such evidence of the advantages, tax payers resent the increased cost of the reduced pupil-teacher ratios. Support for Follow-Through programs has not increased (Hunt, 1975a, pp. 311-316).

TREATMENT VERSUS PREVENTION

That children of uneducated parents of poverty come to school with a lower level of educational achievement than do children from better educated families of middle class is a truism illustrated by the fact that less than a quarter of those in Head Start classes can correctly designate a sample of six colored blocks verbally indicated by the names of their colors, but 90% of nursery-school children from middle class families can. The educational deficiencies also include other school related skills, motivational systems, and values. Yet, these children from uneducated families of poverty need have no inherent limitations on their capacity for learning. In view of their deficiencies, however, confronting them with curricula and lesson plans designed for children of average or superior achievement inevitably leads to that distressful confusion that comes from encountering information beyond one's ken and challenges beyond one's coping capacity

Efforts to cope with the educational problems created by such dfifering levels of achievement have been attempted through "tracking," or dividing pupils into categories according to their levels of previous achievement. This practice almost inevitably results in the applications of terms of scorn to those at the low levels of achievement. We have found no evidences of race differences among children of Head Start (Kirk, Hunt, et al., 1975), but by virtue of the historic role of Black people in the United States, a higher proportion of Black than of white children are to be found in the underclass whence come the children in Head Start programs. Since skin color is a prominent feature, these terms of scorn or opprobrium get applied to them. Moreover, since traditional teaching has accepted slowness of learning as the explanation of the deficiencies of these children from uneducated families of poverty, efforts are almost never made to find the missing abilities, motives, and skills for children in the "slow tracks." So they have no chance to gain.

Individualizing the teaching-learning process is another means for attacking this educational problem. Individualized teaching, however, calls for skills very different from those commonly taught in schools of education. Individualized teaching requires knowledge of the developmental hierarchy of understandings, abilities, and motivational systems, knowledge which actually does not yet exist in an adequate degree. Moreover, individualized teaching calls for skill in rapid diagnosis of children's individual achievements and skill in being able to arrange situations to provide individual children with experiences that will be challenging and meaningful in terms of "where they are." Traditional teaching is based on curricula and teachers are charged with keeping the attention of groups of children on lesson plans that they have prepared, with the subject matter rather than the children as their foremost concern. Those taught to teach in this latter fashion have tremendous difficulty in individualizing the teaching process. Thus, despite the denegration of the "lock-step" in education, it is exceedingly difficult to transform traditional schools quickly into good open schools for individualized teaching (Hunt, 1975b).

Compensatory education is a third approach to this problem. Compensatory education, however, is both difficult and expensive. It is difficult because it calls not only for learning new skills, but it has a therapeutic aspect: some of the attitudinal and motivational characteristics of children of poverty must be modified. It is expensive because it extends schooling down the age range to the fifth or even fourth year. It is also expensive because, to be effective, the number of students per teacher must be decreased and because this decreased student-teacher ratio must be extended up through the Follow-Through years. It is also expensive because professional teachers in the schools take over what has long been the preschool pedagogic functions of parents. Thus, the old adage of an ounce of prevention being worth a pound of the cure may be applicable here. Perhaps a major share of parents from the underclass can be taught to be more effective teachers of their infants and young children.

The idea of teaching parenting is far from new. It was part of the Child Study Movement founded by G. Stanley Hall in the 1880s. It has been part of the Mental Hygiene Movement since it was organized by Clifford Beers in 1909. During the 1950s and 1960s, the National Institute of Mental Health supported a substantial number of efforts by clinical psychologists, psychiatrists, and social workers to teach parents through psychotherapy-like talk, individual and group, how better to foster the intellectual and motivational development of their infants and young children. These efforts failed utterly because the language deficiencies of people from the underclass went unrecognized. Susan Gray and Rupert Klaus (1965) of the George Peabody College of Teachers deserve credit for pioneering the way. They invited the mothers of pupils in to observe the teachers in their compensatory classes. This provided the mothers with models to imitate. Observing these models provided the mothers with a basis for asking the reasons for the teachers' actions. Moreover, Gray and Klaus sent demonstrators into the homes to help the mothers apply at home what they had learned from observation and discussion in classrooms. Not only did gains occur in the target children within these families, but gains occurred also in the development of siblings older and younger (termed "vertical dissemination") and in the children of neighboring parents with whom those participating had vace-to-vace interaction (termed "horizontal dissemination"). Not only were there evidences of these two forms of dissemination, but the gains shown by the target children even though modest, persisted through the third grade (Gray & Klaus, 1970). There was still another exciting consequence: many of the mothers were motivated to improve their own educational and occupational skills. Many of them also became leaders in efforts to improve the neighborhoods and schools for their children (Miller, 1968).

These findings of Gray and Klaus figured strongly in the recommendation of the White House task force to extend Project Head Start down the age scale in Parent and Child Centers (Hunt, Chairman, 1967). These Centers were to be a new kind of social institution which would coordinate for parents and their children the services of all the social agencies in the community in order to foster the development of competence in infants and preschool children. This recommendation was probably too broad. All too often the effort to coordinate professional services took precedence, and involving parents in improving their child-rearing practices went by the board. My own observation of these centers has led to a tentative impression that professional training in such fields as clinical

psychology, social work, special education, and the like tends to unfit people for leadership of such novel institutions (see Hunt, 1975a, pp. 316-319). Too often, those professionally trained are prone to rely on the "bag of tricks" that were taught them in professional school instead of coping creatively with the situation then encounter. Several others have demonstrated ways to teach parents, and especially mothers, to be better teachers of their infants and young children. At the University of Florida, Ira Gordon (1971) has selected and trained able women from the working class to show mothers of infants a series of "learning games" inspired by Jean Piaget's descriptions of sensorimotor development. The modest gains from Gordon's program have been larger in the case of girls than of boys, and larger when the programs began with infants of three months than with infants of twelve months.

Probably the most thoroughly tested of these programs for preventing retardation through parent education is Phyllis Levenstein's (1976) Mother-Child Home Program. Beginning in 1965 with a successful pilot study in which social workers made 15 teaching visits of from 20 to 25 minutes to six mother-infant dyads in their homes over a four-month period beginning when the infants were about two years old, Levenstein has proceeded to develop and test a technique which now consists of providing toys to demonstrate for mothers how to employ these toys in verbal interaction to inculcate what I call semantic mastery for colors, forms, sizes, and various manipulations of the toys, how to elicit questions and verbal responses to toys and books how to encourage verbalizations of alternatives and consequences, how to create interest in books by eliciting verbalizations about illustrations, and how to establish an infant's appreciation of spatial positions. Several samplings of 30 children have shown average gains ranging between 15 and 20 points of IQ. Such gains are based upon a two-year program beginning with children at about a year and a half of age with trained paraprofessionals as the teachers. The children have held most of their gains through follow-up tests four to five years after the special training terminated. Presumably the gains persisted because the mothers continued to interact verbally with their children in supportive fashion and continued to take an interest in fostering their children's educational progress. The mothers also show gains such as Gray and Klaus found. The social impact of such a program depends upon how high a portion of the women from the underclass can be recruited for participation. Although Levenstein claims participation to be no problem, there is no empirical evidence of the proportion recruitable (see Hunt, 1975a, 298-303).

Another of these is the Mothers' Training Program of Earladeen Badger (1971a, 1972), with her teaching guides for infants (Badger, 1971b) and toddlers (Badger, 1971c). It was this program, supplemented with a way to foster vocal imitation and a way to foster semantic mastery, that we taught the caretakers at the Orphanage of the Queen Farah Pahlavi Charity Society in Tehran. The 11 foundlings cared for by these tutored caretakers not only achieved the top steps on the Piaget-inspired scales of Uzgiris and Hunt (1975) at mean ages younger by 48 to 98 weeks than they were achieved by controls, but they achieved the top steps on five of these seven scales at mean ages somewhat younger than did 12 home-reared infants from predominantly professional families in Worcester, Mass. (see Hunt, et al., 1976). The gist of the Badger technique consists of teaching mothers

how to be responsive, at least vocally, to their infant's appeals for attention, to teach them how to distinguish the behavioral signs of interest from those of distress from being overmatched with information or demands beyond coping limits and from boredom that comes from being undermatched with situations that have been "old stuff." The supplement to foster vocal imitation consisted in having the caretakers imitate the cooing of infants to get interactive vocal games going. The caretakers were to continue these games through the babbling phase. Once the infant had shown several babbling patterns, the caretaker was to introduce verbal games of "follow-the leader" in which she shifted from one babbling pattern to another. Once the child had acquired skill in following these shifts, the caretaker brought the child to genuine imitation by modeling phonemic patterns that she had never heard the child utter. The procedure of fostering semantic mastery was based on the assumption that it comes about through the association of vocal signs with objects perceived and recognized. The procedure was designed to make what is symbolized stand out while the vocal sign for it was being spoken with emphasis by the caretaker. Thus, the caretakers were requested to talk about their caretaking activities as they conducted them. The paradigm consisted of preceeding ear-washing with the statement: "Now I'm going to wash your ear." As vocal emphasis hit the word ear, the washcloth made contact with the anatomical ear. As was the case with mothers in the program of Gray and Klaus, the majority of the mothers in the Badger program have taken a new lease on life.

Mrs. Badger has also solved the recruitment problem which loomed large with interventions introduced during the second year in the lives of the target infants (Karnes, et al., 1970). Badger has discovered that when mothers are approached on the day following that on which they have given birth, they are highly interested in the fate of their newborns and are readily recruited in the classes for the purpose of learning how to foster their development. Moreover somewhat more than 90% of them regularly attend classes for approximately two years, and about 75% show improved skill with their infants (Badger, Elsaser & Sutherland, 1974).

Although efforts to prevent the development of incompetence in children of parents from the underclass by training them to be better teachers of their infants and young children is barely beyond the exploratory stage, it appears to be the most promising approach to early childhood education on the horizon. If pediatricians as a professional group should join in the effort to help mothers with their pedagogic responsibilities for their infants, it could be a boon to society. If the schools, and agencies for family service, child protection, and the like can be gotten to devotepart of their staff effort to helping mothers from the underclass cope with their educational responsibilities as their infants become toddlers and preschool children, it is conceivable that most of the children of uneducated parents of poverty can be enabled to enter school with a complement of competencies that will enable them to cope with the all too rigid demands of traditional schools. Although individual differences are real, from the evidence now available, I believe that all children born without pathology have the genotypic potential required to achieve all the information, motives, skills, and values required for participation in the mainstream of any culture in the world.

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